

**Supplemental Material**  
**Urinary Polycyclic Aromatic Hydrocarbons and Childhood  
Obesity: NHANES (2001–2006)**

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**Supplemental Material, Table S1.** Multivariate linear regression beta coefficient (95% CI) association between BMI z-score, waist circumference and PAHs.<sup>a</sup>

	6-19 years	6-11 years	12-19 years
<b>OUTCOME: BMI z-Score</b>			
<b>1-naphthol (ng/L)</b>			
Q 1: ≤ 690.86	Referent	Referent	Referent
Q 2: 690.87 - 1318.24	0.06 (-0.08, 0.21) p=0.36	0.05 (-0.13, 0.23) p=0.58	0.11 (-0.10, 0.31) p=0.31
Q 3: 1318.25 - 3201.00	0.16 (-0.00, 0.32) p>0.05	0.22 (-0.07, 0.51) P=0.13	0.14 (-0.07, 0.36) p=0.19
Q 4: > 3201.00	0.14 (-0.02, 0.30) p=0.09	0.16 (-0.13, 0.46) p=0.26	0.17 (-0.07, 0.42) p=0.16
<b>2-naphthol (ng/L)</b>			
Q 1: ≤ 1338.02	Referent	Referent	Referent
Q 2: 1338.03 - 2409.16	0.24 (0.06, 0.43) p=0.01	0.40 (0.17, 0.64) p<0.01	0.14 (-0.14, 0.43) p=0.31
Q 3: 2409.17 - 4633.60	0.29 (0.14, 0.45) p<0.01	0.43 (0.18, 0.68) p<0.01	0.20 (-0.03, 0.43) p=0.08
Q 4: > 4633.60	0.38 (0.23, 0.54) p<0.01	0.59 (0.34, 0.84) p<0.01	0.24 (-0.04, 0.51) p=0.09
<b>2-fluorene (ng/L)</b>			
Q 1: ≤ 137.34	Referent	Referent	Referent
Q 2: 137.35 - 254.33	0.00 (-0.14, 0.14) p=0.98	0.10 (-0.10, 0.31) p=0.32	-0.04 (-0.23, 0.16) p=0.71
Q 3: 254.33 - 425.40	0.12 (-0.07, 0.30) p=0.21	0.23 (-0.06, 0.53) p=0.12	0.08 (-0.17, 0.32) p=0.53
Q 4: > 425.40	0.11 (-0.11, 0.33) p=0.34	0.23 (-0.14, 0.59) p=0.23	0.08 (-0.20, 0.35) p=0.57
<b>3-fluorene (ng/L)</b>			
Q 1: ≤ 55.94	Referent	Referent	Referent
Q 2: 55.95 - 100.87	0.05 (-0.11, 0.21) p=0.53	0.06 (-0.14, 0.27) p=0.52	0.10 (-0.10, 0.31) p=0.31
Q 3: 100.88 - 178.88	0.08 (-0.09, 0.24) p=0.36	0.15 (-0.10, 0.40) p=0.23	0.04 (-0.16, 0.25) p=0.67
Q 4: > 178.88	-0.03 (-0.23, 0.18) p=0.80	0.09 (-0.23, 0.41) p=0.57	-0.02 (-0.31, 0.26) p=0.87
<b>1-phenanthrene (ng/L)</b>			
Q 1: ≤ 77.07	Referent	Referent	Referent
Q 2: 77.08 - 136.45	0.19 (0.03, 0.36) p=0.02	0.28 (0.07, 0.49) p=0.01	0.16 (-0.03, 0.34) p=0.10
Q 3: 136.46 - 241.26	0.18 (-0.02, 0.39) p=0.08	0.18 (-0.16, 0.52) p=0.29	0.24 (0.02, 0.45) p=0.04
Q 4: > 241.26	0.28 (0.01, 0.54) p=0.04	0.29 (-0.12, 0.70) p=0.16	0.34 (0.04, 0.64) p=0.03
<b>2-phenanthrene (ng/L)</b>			
Q 1: ≤ 28.16	Referent	Referent	Referent
Q 2: 28.17 - 53.16	0.06 (-0.13, 0.24) p=0.54	0.08 (-0.13, 0.29) p=0.46	0.10 (-0.12, 0.32) p=0.36
Q 3: 53.17 - 92.74	0.28 (0.07, 0.49) p=0.01	0.37 (0.09, 0.64) p=0.01	0.25 (-0.03, 0.54) p=0.08
Q 4: > 92.74	0.34 (0.06, 0.62) p=0.02	0.33 (0.01, 0.66) p=0.04	0.39 (0.02, 0.76) p=0.04
<b>3-phenanthrene (ng/L)</b>			
Q 1: ≤ 60.06	Referent	Referent	Referent
Q 2: 60.07 - 106.24	0.04 (-0.14, 0.21) p=0.67	0.10 (-0.12, 0.31) p=0.37	0.02 (-0.19, 0.24) p=0.83
Q 3: 106.25 - 193.97	0.10 (-0.10, 0.30) p=0.33	0.15 (-0.14, 0.44) P=0.30	0.09 (-0.18, 0.37) p=0.50
Q 4: > 193.97	0.02 (-0.25, 0.28) p=0.90	0.02 (-0.33, 0.37) p=0.92	0.08 (-0.27, 0.43) p=0.65
<b>1-pyrene (ng/L)</b>			
Q 1: ≤ 50.18	Referent	Referent	Referent
Q 2: 50.19 - 98.83	0.13 (-0.04, 0.30) p=0.13	0.24 (-0.01, 0.49) p=0.06	0.08 (-0.13, 0.29) p=0.47
Q 3: 98.84 - 187.17	0.02 (-0.15, 0.18) p=0.84	0.05 (-0.20, 0.31) p=0.69	0.04 (-0.16, 0.24) p=0.68
Q 4: > 187.17	0.01 (-0.19, 0.21) p=0.92	0.12 (-0.23, 0.47) p=0.50	0.00 (-0.27, 0.28) p=0.99
<b>∑mol3-4 PAHs (nmol/L):</b>			
Q 1: ≤ 2.37	Referent	Referent	Referent
Q 2: 2.38 - 4.19	0.01 (-0.18, 0.20) p=0.94	0.12 (-0.12, 0.36) p=0.31	-0.04 (-0.25, 0.17) p=0.71
Q 3: 4.20 - 6.99	0.07 (-0.12, 0.27) p=0.44	0.19 (-0.15, 0.53) p=0.27	0.04 (-0.15, 0.23) p=0.69
Q 4: > 6.99	0.05 (-0.12, 0.27) p=0.65	0.20 (0.18, 0.58) p=0.30	0.02 (-0.27, 0.32) p=0.87

	6-19 years	6-11 years	12-19 years
<b>OUTCOME: Waist circumference</b>			
<b>1-naphthol (ng/L)</b>			
Q 1: ≤ 690.86	Referent	Referent	Referent
Q 2: 690.87 - 1318.24	-0.48 (-1.98, 1.03) p=0.53	-0.10 (-1.96, 1.76) p=0.92	-0.23 (-2.31, 1.85) p=0.83
Q 3: 1318.25 - 3201.00	0.47 (-0.78, 1.71) p=0.46	0.96 (-1.60, 3.51) p=0.46	0.63 (-1.29, 2.55) p=0.51
Q 4: > 3201.00	0.22 (-1.48, 1.92) p=0.80	0.84 (-1.44, 3.13) p=0.46	0.94 (-1.59, 3.48) p=0.46
<b>2-naphthol (ng/L)</b>			
Q 1: ≤ 1338.02	Referent	Referent	Referent
Q 2: 1338.03 - 2409.16	1.60 (-0.07, 3.27) p=0.06	2.44 (0.19, 4.70) p=0.03	1.48 (-1.10, 4.06) p=0.25
Q 3: 2409.17 - 4633.60	2.47 (1.02, 3.92) p<0.01	3.23 (1.05, 5.40) p<0.01	2.81 (0.58, 5.03) p=0.01
Q 4: > 4633.60	2.67 (1.10, 4.24) p<0.01	4.23 (1.74, 6.72) p<0.01	2.63 (0.04, 5.22) p<0.05
<b>2-fluorene (ng/L)</b>			
Q 1: ≤ 137.34	Referent	Referent	Referent
Q 2: 137.35 - 254.33	0.73 (-0.89, 2.36) p=0.37	1.29 (-0.70, 3.29) p=0.20	0.84 (-1.37, 3.06) p=0.45
Q 3: 254.33 - 425.40	1.39 (-0.56, 3.33) p=0.16	0.98 (-1.62, 3.59) p=0.45	2.32 (-0.83, 5.47) p=0.14
Q 4: > 425.40	1.37 (-1.36, 4.10) p=0.32	1.70 (-1.75, 5.15) p=0.33	2.21 (-1.25, 5.67) p=0.20
<b>3-fluorene (ng/L)</b>			
Q 1: ≤ 55.94	Referent	Referent	Referent
Q 2: 55.95 - 100.87	1.10 (-0.39, 2.59) p=0.14	1.64 (-0.26, 3.53) p=0.09	1.69 (-0.33, 3.70) p=0.10
Q 3: 100.88 - 178.88	0.50 (-1.81, 2.80) p=0.67	0.87 (-1.31, 3.05) p=0.42	0.44 (-2.66, 3.54) p=0.78
Q 4: > 178.88	-0.98 (-3.46, 1.50) p=0.43	0.11 (-2.56, 2.79) p=0.93	-0.43 (-3.61, 2.75) p=0.79
<b>1-phenanthrene (ng/L)</b>			
Q 1: ≤ 77.07	Referent	Referent	Referent
Q 2: 77.08 - 136.45	0.66 (-1.13, 2.44) p=0.46	1.04 (-1.02, 3.11) p=0.31	0.94 (-1.24, 3.12) p=0.39
Q 3: 136.46 - 241.26	1.15 (-0.75, 3.05) p=0.23	1.56 (-1.15, 4.26) p=0.25	1.75 (-0.69, 4.20) p=0.16
Q 4: > 241.26	2.20 (-0.87, 5.26) p=0.16	0.98 (-2.47, 4.43) p=0.57	4.04 (0.24, 7.84) p=0.04
<b>2-phenanthrene (ng/L)</b>			
Q 1: ≤ 28.16	Referent	Referent	Referent
Q 2: 28.17 - 53.16	0.06 (-1.75, 1.87) p=0.95	-0.20 (-2.04, 1.64) p=0.83	1.15 (-1.15, 3.44) p=0.32
Q 3: 53.17 - 92.74	2.49 (0.36, 4.61) p=0.02	2.72 (0.09, 5.34) p=0.04	2.82 (-0.22, 5.86) p=0.07
Q 4: > 92.74	3.34 (0.17, 6.51) p=0.04	1.73 (-1.22, 4.68) p=0.24	5.21 (1.07, 9.35) p=0.01
<b>3-phenanthrene (ng/L)</b>			
Q 1: ≤ 60.06	Referent	Referent	Referent
Q 2: 60.07 - 106.24	0.09 (-1.85, 2.02) p=0.93	0.72 (-1.73, 3.18) p=0.56	-0.03 (-2.31, 2.24) p=0.98
Q 3: 106.25 - 193.97	0.39 (-2.06, 2.84) p=0.75	1.10 (-1.74, 3.95) p=0.44	0.44 (-3.05, 3.93) p=0.80
Q 4: > 193.97	-0.56 (-3.40, 2.27) p=0.69	-0.65 (-4.19, 2.89) p=0.71	0.53 (-3.12, 4.18) p=0.77
<b>1-pyrene (ng/L)</b>			
Q 1: ≤ 50.18	Referent	Referent	Referent
Q 2: 50.19 - 98.83	0.46 (-1.18, 2.10) p=0.57	0.29 (-2.39, 2.96) p=0.83	0.84 (-1.31, 2.98) p=0.44
Q 3: 98.84 - 187.17	0.08 (-2.05, 2.22) p=0.94	-0.25 (-2.81, 2.30) p=0.84	1.10 (-1.39, 3.59) p=0.38
Q 4: > 187.17	-0.99 (-3.27, 1.30) p=0.39	-1.02 (-4.60, 2.55) p=0.57	0.00 (-2.90, 2.91) p=1.00
<b>∑mol3-4 PAHs (nmol/L)</b>			
Q 1: ≤ 2.37	Referent	Referent	Referent
Q 2: 2.38 - 4.19	0.02 (-2.04, 2.08) p=0.98	0.42(-1.97, 2.81) p=0.73	0.37 (-2.29, 3.04) p=0.78
Q 3: 4.20 - 6.99	0.91 (-1.38, 3.21) p=0.43	1.11 (-1.98, 4.20) p=0.47	1.52 (-1.45, 4.50) p=0.31
Q 4: > 6.99	-0.13 (-3.16, 2.89) p=0.93	0.09(-3.63, 3.81) p=0.96	1.00 (-2.90, 4.90) p=0.61

<sup>a</sup>**Adjusted** for age, race/ethnicity, gender, urinary creatinine, poverty income ratio (PIR), serum cotinine, serum c-reactive protein, calorie intake, and television, videogame and computer usage.

**Supplemental Material, Table S2.** Full multinomial logistic regression models of association between urinary PAHs and obesity and overweight versus normal/underweight. OR (95% CI).<sup>a</sup>

Exposure	6-19 years Obese vs. normal	6-19 years Overweight vs. normal	6-11 years Obese vs. normal	6-11 years Overweight vs. normal	12-19 years Obese vs. normal	12-19 years Overweight vs. normal
<b>1-naphthol (ng/L)</b>						
Q 1: ≤ 690.86	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 690.87 - 1318.24	1.32 (0.76, 2.29)	0.93 (0.55, 1.56)	1.54 (0.73, 3.24)	1.41 (0.74, 2.68)	1.32 (0.65, 2.65)	0.76 (0.37, 1.54)
Q 3: 1318.25 - 3201.00	1.45 (0.91, 2.31)	1.06 (0.68, 1.66)	1.34 (0.60, 2.98)	1.62 (0.87, 3.04)	1.62 (0.85, 3.08)	0.75 (0.44, 1.28)
Q 4: > 3201.00	1.72 (0.98, 3.01)	0.87 (0.55, 1.37)	2.62 (1.12, 6.16)	1.57 (0.67, 3.68)	1.63 (0.72, 3.67)	0.62 (0.38, 1.01)
<b>2-naphthol (ng/L)</b>						
Q 1: ≤ 1338.02	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 1338.03 - 2409.16	1.86 (1.10, 3.14)	1.40 (0.81, 2.43)	1.49 (0.61, 3.63)	2.11 (1.07, 4.16)	2.38 (1.20, 4.72)	1.07 (0.50, 2.25)
Q 3: 2409.17 - 4633.60	1.95 (1.17, 3.24)	1.36 (0.94, 1.96)	2.18 (0.90, 5.28)	1.65 (0.93, 2.94)	2.05 (1.06, 3.94)	1.20 (0.66, 2.16)
Q 4: > 4633.60	2.03 (1.23, 3.33)	1.34 (0.78, 2.31)	2.30 (1.08, 4.89)	1.70 (0.68, 4.25)	2.20 (1.02, 4.77)	1.14 (0.53, 2.43)
<b>2-fluorene (ng/L)</b>						
Q 1: ≤ 137.34	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 137.35 - 254.33	1.11 (0.70, 1.75)	0.69 (0.39, 1.23)	1.11 (0.57, 2.16)	0.64 (0.26, 1.54)	1.21 (0.66, 2.22)	0.78 (0.35, 1.72)
Q 3: 254.33 - 425.40	1.40 (0.77, 2.54)	0.76 (0.43, 1.31)	1.03 (0.42, 2.54)	1.00 (0.39, 2.57)	1.90 (0.83, 4.33)	0.68 (0.36, 1.28)
Q 4: > 425.40	1.13 (0.59, 2.19)	0.87 (0.47, 1.60)	1.12 (0.40, 3.14)	1.15 (0.39, 3.41)	1.46 (0.60, 3.55)	0.79 (0.39, 1.62)
<b>3-fluorene (ng/L)</b>						
Q 1: ≤ 55.94	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 55.95 - 100.87	1.88 (1.26, 2.80)	0.73 (0.44, 1.23)	1.41 (0.74, 2.69)	0.55 (0.27, 1.13)	2.66 (1.58, 4.47)	1.03 (0.50, 2.14)
Q 3: 100.88 - 178.88	1.20 (0.67, 2.15)	0.88 (0.55, 1.40)	1.19 (0.47, 3.03)	1.02 (0.53, 1.98)	1.22 (0.57, 2.61)	0.80 (0.39, 1.65)
Q 4: > 178.88	0.87 (0.50, 1.51)	0.74 (0.42, 1.29)	0.82 (0.34, 1.97)	0.80 (0.33, 1.96)	1.16 (0.54, 2.47)	0.76 (0.34, 1.72)
<b>1-phenanthrene (ng/L)</b>						
Q 1: ≤ 77.07	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 77.08 - 136.45	0.98 (0.57, 1.69)	1.09 (0.65, 1.83)	1.32 (0.60, 2.86)	1.18 (0.61, 2.28)	0.83 (0.45, 1.54)	1.18 (0.66, 2.13)
Q 3: 136.46 - 241.26	1.06 (0.62, 1.79)	1.02 (0.60, 1.73)	0.91 (0.36, 2.34)	1.04 (0.45, 2.38)	1.23 (0.63, 2.41)	1.09 (0.56, 2.15)
Q 4: > 241.26	1.22 (0.60, 2.49)	1.18 (0.69, 2.01)	0.79 (0.25, 2.50)	1.70 (0.63, 4.54)	1.73 (0.71, 4.24)	1.07 (0.57, 2.02)

<b>Exposure</b>	<b>6-19 years Obese vs. normal</b>	<b>6-19 years Overweight vs. normal</b>	<b>6-11 years Obese vs. normal</b>	<b>6-11 years Overweight vs. normal</b>	<b>12-19 years Obese vs. normal</b>	<b>12-19 years Overweight vs. normal</b>
<b>2-phenanthrene (ng/L)</b>						
Q 1: ≤ 28.16	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 28.17 - 53.16	1.11 (0.60, 2.07)	1.04 (0.72, 1.52)	1.34 (0.62, 2.91)	0.78 (0.42, 1.45)	0.96 (0.44, 2.09)	1.42 (0.81, 2.50)
Q 3: 53.17 - 92.74	1.55 (0.81, 2.95)	1.30 (0.73, 2.33)	1.72 (0.60, 4.99)	1.33 (0.55, 3.22)	1.56 (0.66, 3.67)	1.38 (0.68, 2.81)
Q 4: > 92.74	1.71 (0.83, 3.54)	1.48 (0.87, 2.52)	1.44 (0.49, 4.27)	1.66 (0.72, 3.85)	2.07 (0.82, 5.26)	1.56 (0.79, 3.09)
<b>3-phenanthrene (ng/L)</b>						
Q 1: ≤ 60.06	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 60.07 - 106.24	0.88 (0.47, 1.64)	0.85 (0.51, 1.43)	1.20 (0.46, 3.12)	1.01 (0.48, 2.12)	0.74 (0.37, 1.50)	0.76 (0.38, 1.52)
Q 3: 106.25 - 193.97	0.82 (0.40, 1.67)	0.80 (0.50, 1.29)	1.18 (0.40, 3.47)	0.97 (0.42, 2.23)	0.71 (0.29, 1.73)	0.70 (0.37, 1.32)
Q 4: > 193.97	0.63 (0.28, 1.40)	0.85 (0.49, 1.47)	0.67 (0.17, 2.69)	1.29 (0.53, 3.17)	0.68 (0.27, 1.75)	0.63 (0.31, 1.29)
<b>1-pyrene (ng/L)</b>						
Q 1: ≤ 50.18	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 50.19 - 98.83	1.14 (0.68, 1.91)	1.58 (0.95, 2.61)	1.47 (0.65, 3.29)	1.56 (0.67, 3.65)	1.05 (0.54, 2.04)	1.57 (0.82, 2.99)
Q 3: 98.84 - 187.17	0.77 (0.45, 1.30)	1.24 (0.71, 2.18)	0.73 (0.30, 1.76)	1.40 (0.64, 3.06)	0.92 (0.49, 1.70)	1.17 (0.64, 2.15)
Q 4: > 187.17	0.69 (0.37, 1.30)	1.17 (0.70, 1.96)	0.75 (0.24, 2.35)	1.86 (0.60, 5.79)	0.74 (0.36, 1.50)	0.92 (0.47, 1.79)
<b>∑mol3-4 PAHs (nmol/L)</b>						
Q 1: ≤ 2.37	1.00	1.00	1.00	1.00	1.00	1.00
Q 2: 2.38 - 4.19	0.84 (0.47, 1.51)	0.77 (0.43, 1.39)	0.77 (0.37, 1.59)	0.79 (0.34, 1.87)	0.93 (0.48, 1.80)	0.85 (0.37, 1.94)
Q 3: 4.20 - 6.99	1.09 (0.60, 2.00)	0.85 (0.54, 1.35)	1.18 (0.40, 3.49)	0.89 (0.43, 1.85)	1.14 (0.53, 2.44)	0.89 (0.48, 1.64)
Q 4: > 6.99	0.70 (0.32, 1.53)	0.81 (0.47, 1.38)	0.69 (0.21, 2.24)	0.94 (0.35, 2.54)	0.84 (0.33, 2.17)	0.80 (0.39, 1.66)

<sup>a</sup>Adjusted for age, race/ethnicity, gender, urinary creatinine, poverty income ratio (PIR), serum cotinine, serum c-reactive protein, calorie intake, and television, videogame and computer usage.